RELATÓRIO FINAL		NÚMERO DO DOCUMENTO **CT-RE-004-2023**
NOME DO PROJETO – SUBPROJETO - ATIVIDADE **MapSãoFrancisco – Lower Stretch Francisco River** **Mapping populations in flood zones risk** **Multi purpose dynamic research trimaran – prototype**		DATA DA REALIZAÇÃO **17th July 2023**
CONVÊNIO – PATROCÍNIO – APOIO INSTITUCIONAL **Cooperação HOT – Humanitarian OpenStreetMap Team; UFAL – Universidade Federal de Alagoas; InfoSãoFrancisco**		NO. DO CONTRATO **Sem contrato**
REALIZADOR (ES) **Sociedade Socioambiental do Baixo São Francisco – Canoa de Tolda**		
RESPONSÁVEL **Carlos Eduardo Ribeiro Junior**		CARGO – FUNÇÃO **Coordinator/Developer**
ETAPA (S): **MPDT 001 construction and evaluation**	SITUAÇÃO: **Finished** **Last rev. 17/07/2023**	USO: **MapSãoFrancisco/partners**
NOTA:		VERSÃO Português - **English**

1. Background

This report is an update of the previous report, CT-RE-003-2022, with the evolution of the **Multi-purpose Dynamic Research Trimaran** project.

Since the application of the tests with the first and rudimentary experiment which was the model made in foam (during the training activities with the HOT - Humanitarian OpenStreetMap Team in June/July 2022), the project has evolved to the realization of digital modeling of the concept (see CT-RE-002-2023) and is currently at the stage of building two prototypes.

The two prototypes will permit overall hull design validation and multipurpose equipment and sensors installation.

2. Trimaran prototypes construction

At present we have two prototypes under construction with their hulls (mainhull and floats) ready to internal epoxy impregnation, deck installation and external fiberglass layer.

The wood/epoxy construction was selected as we have previous long-term experience (and tools) for this kind of technique in several worldwide oceangoing sailing and powered multihulls. But it needs skills, tooling, materials.

We have a partner in Portugal who is testing a 3D printing smaller (downsized) version. We had some problems exporting the files (DXF for the overall surfaces of the trimarans) but it is a question of the right way to convert these files.

We believe the cheapest and fastest way to build these basic monitoring trimaran hulls will use 3D printing and CND shaper machines (using a softwood, foam block of material to be shaped).

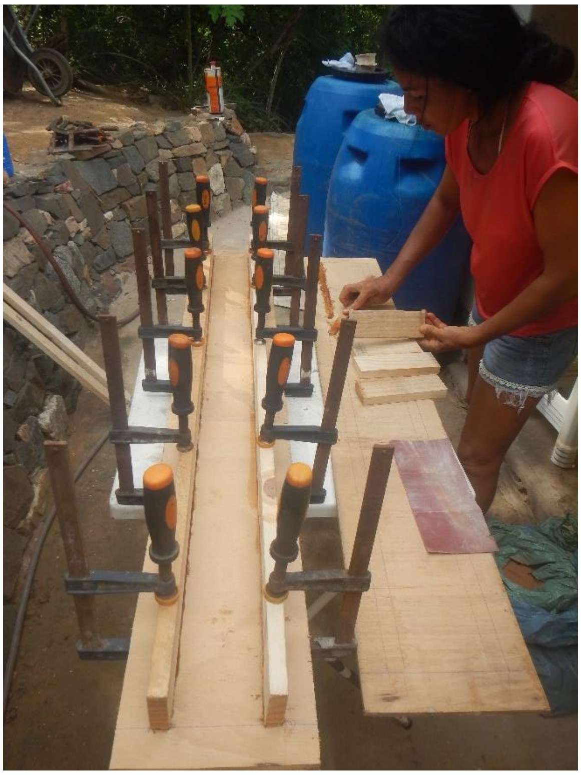


Figura 1 - Preparing the strongbacks.

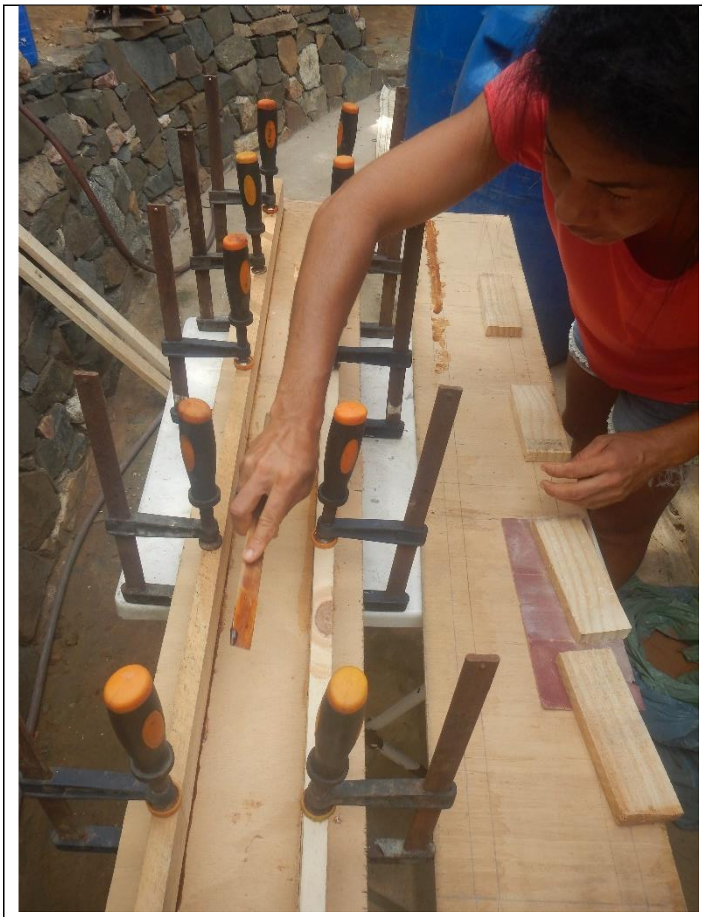
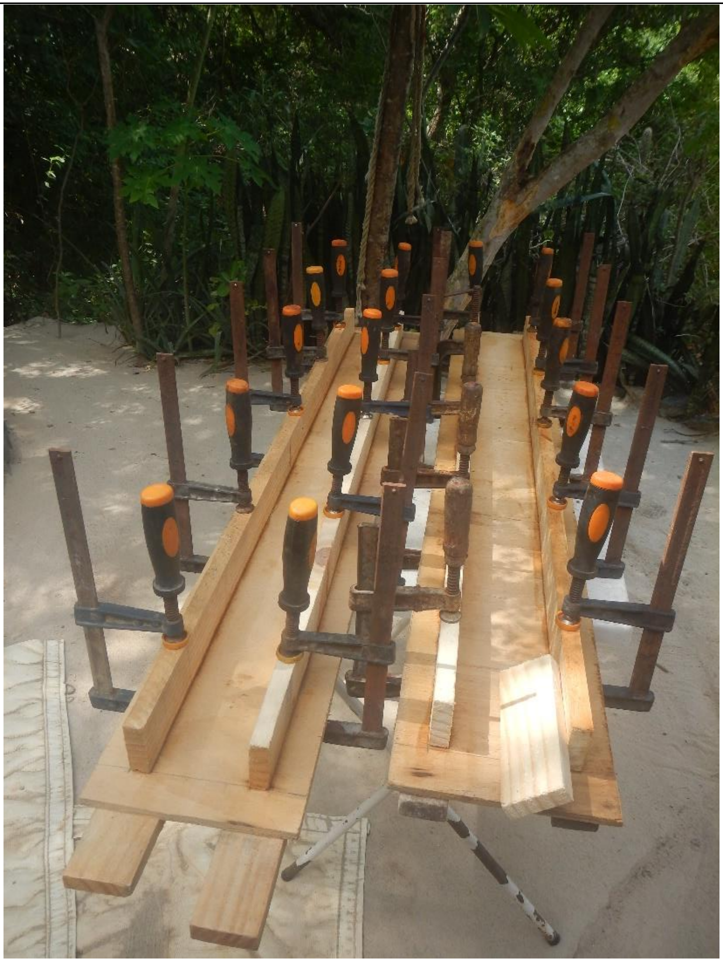


Figura 2 - Idem.



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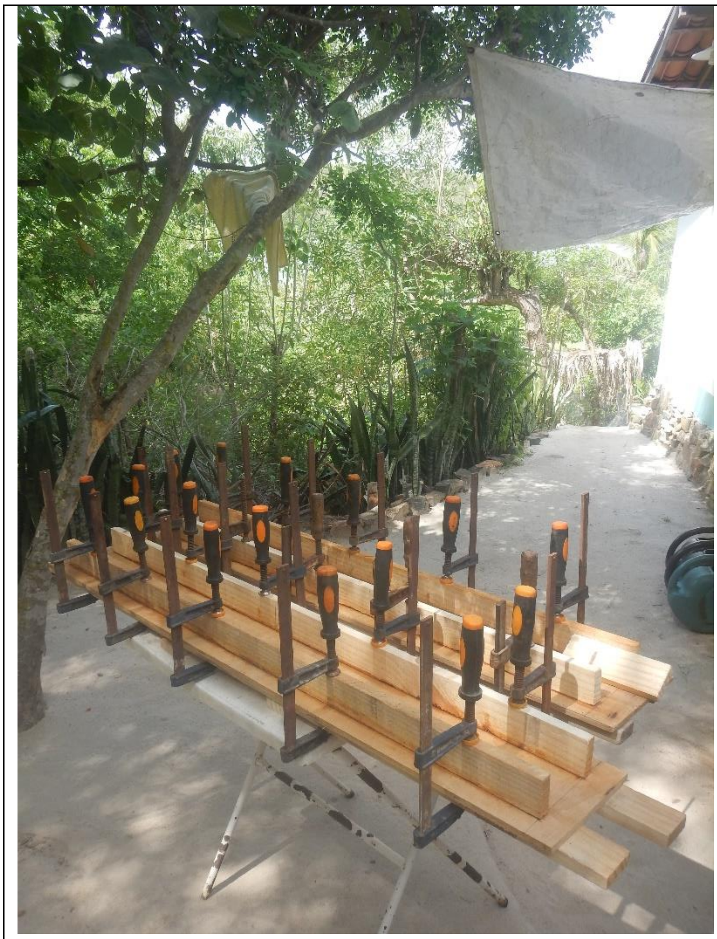

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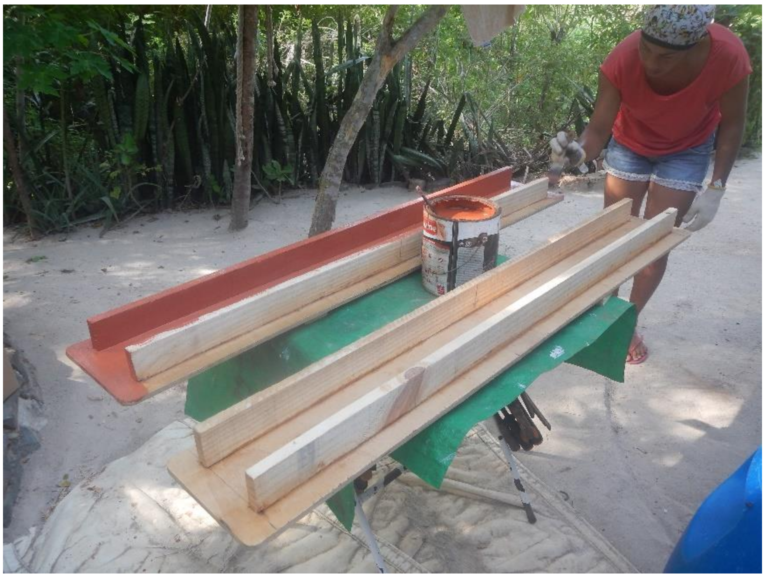
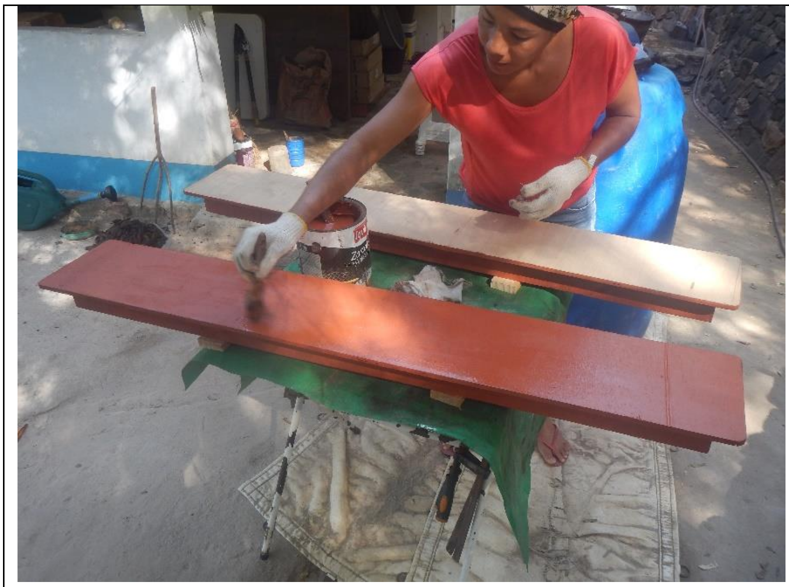


Figura 5 - Some paint coats for protection.



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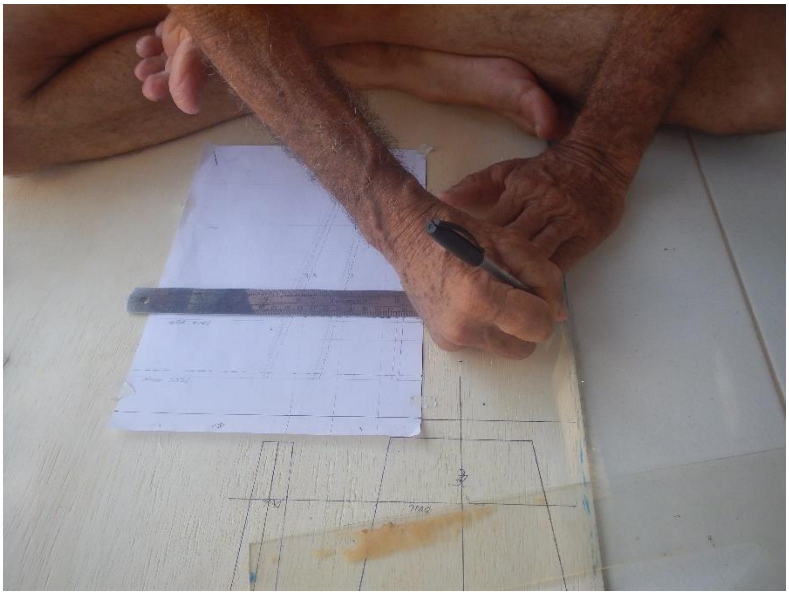
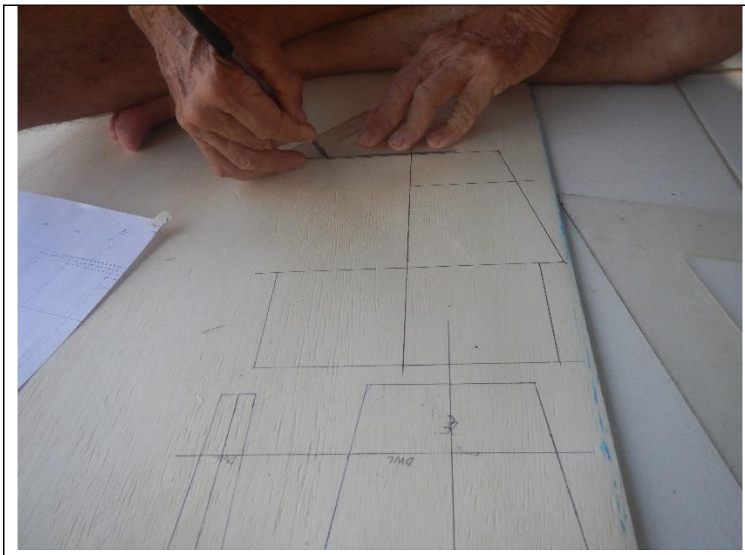


Figura 7 - Drawing 4mm plywood parts/components.



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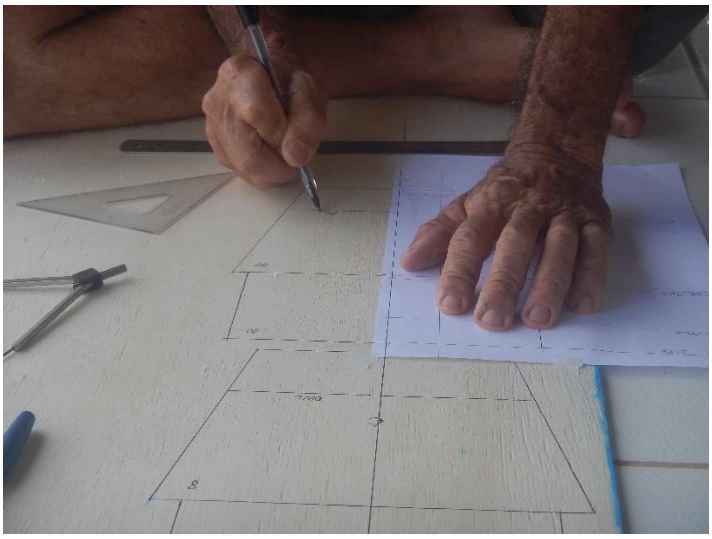
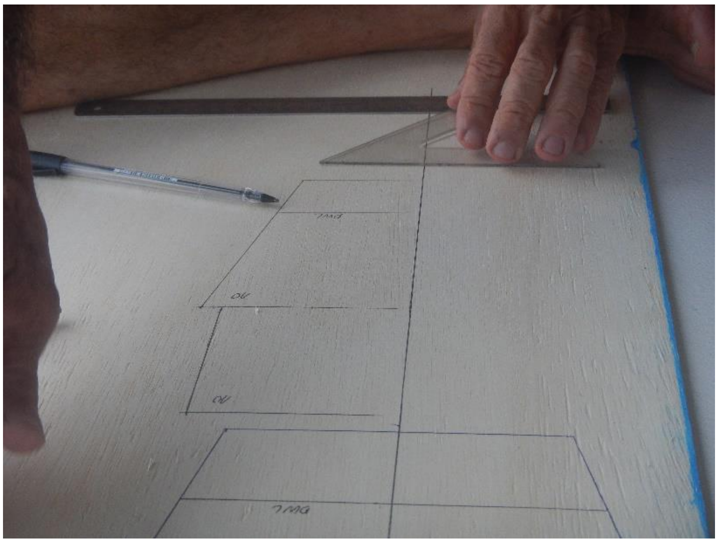


Figura 9 - Idem.



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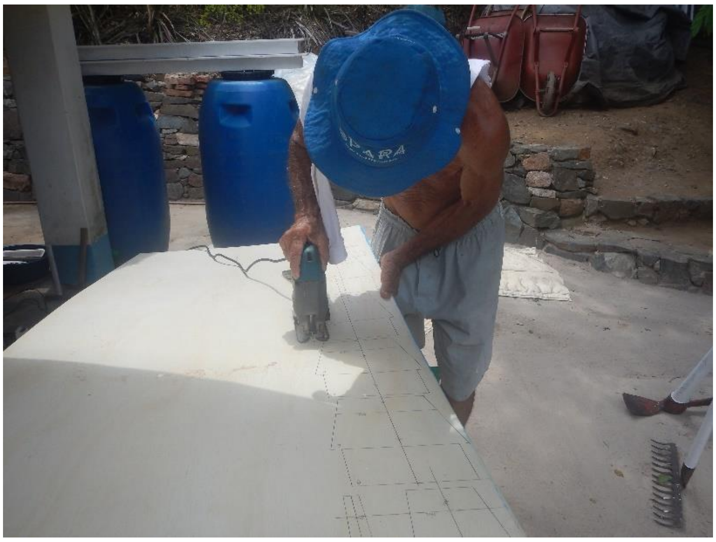


Figura 11 - Cutting the parts.

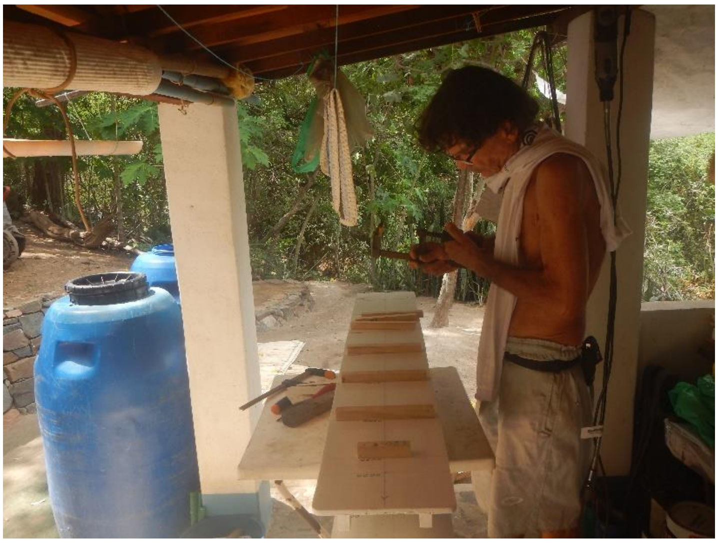
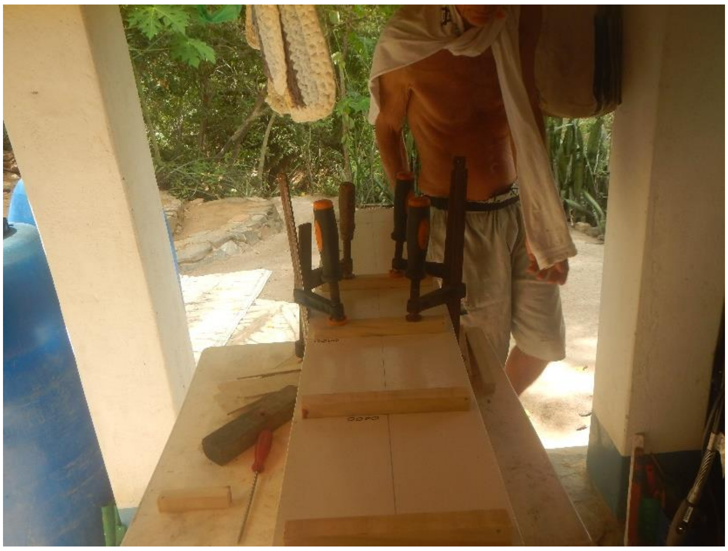


Figura 12 - Assembling the trimaran hulls elements on the strongback.



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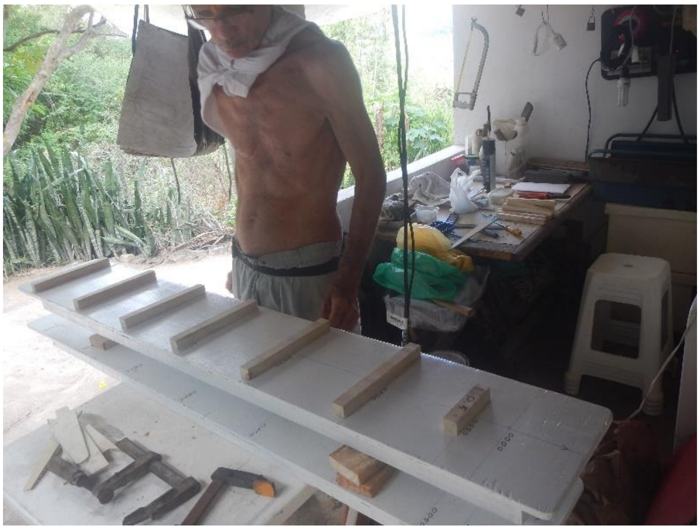

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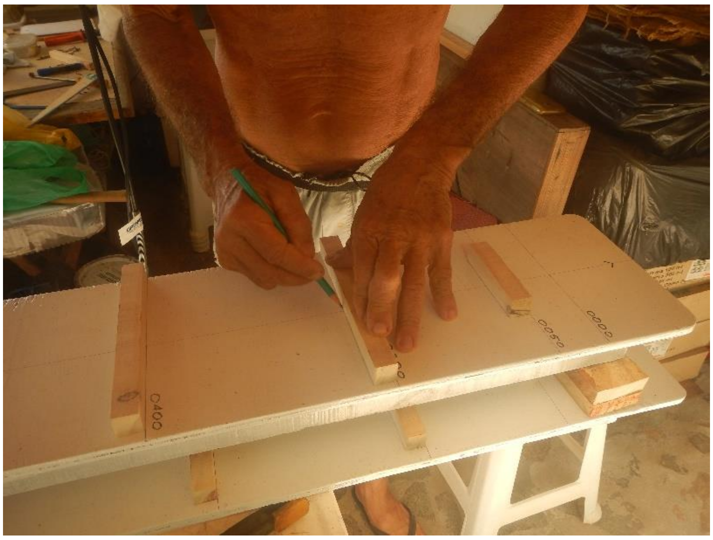

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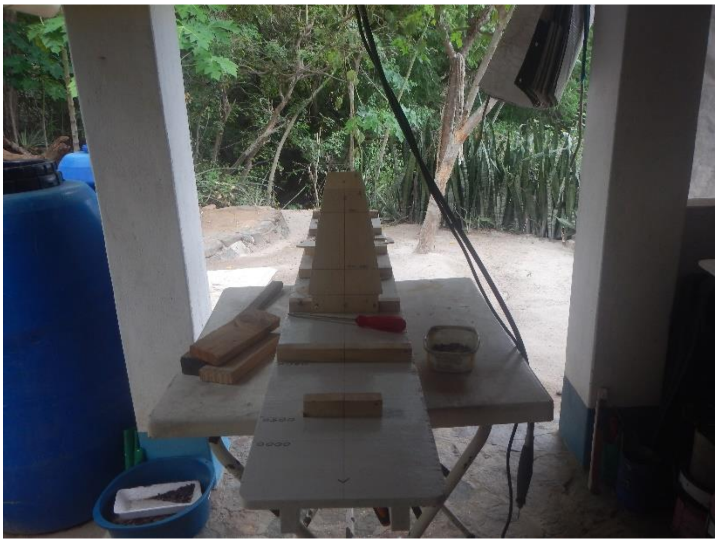


Figura 16 - The main hull bulkheads and frames.

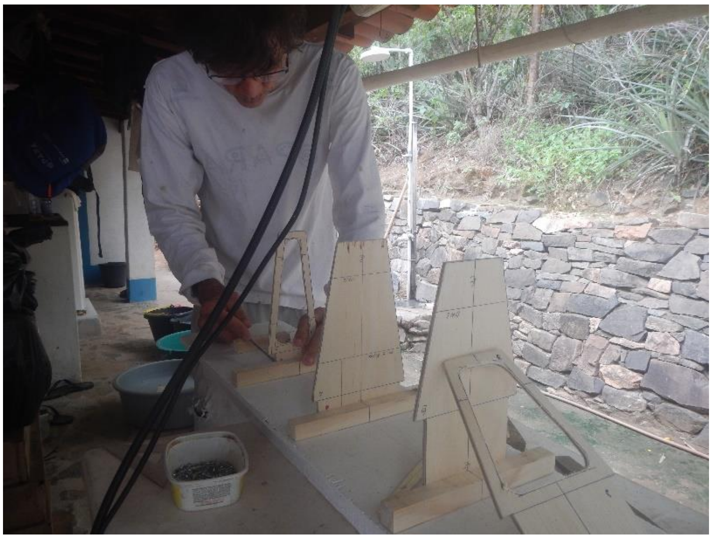
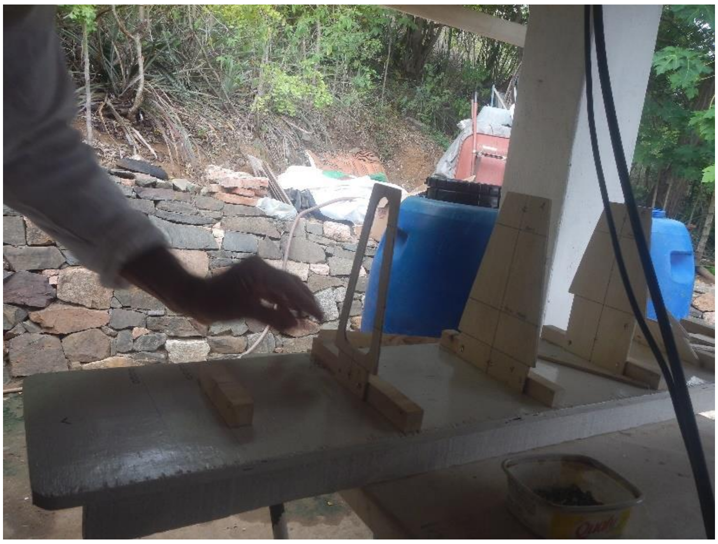


Figura 17 - Float bulkheads and frames.



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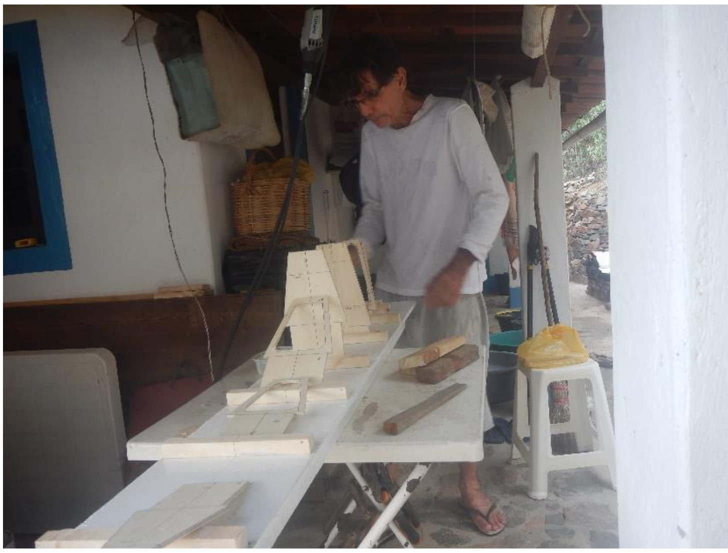

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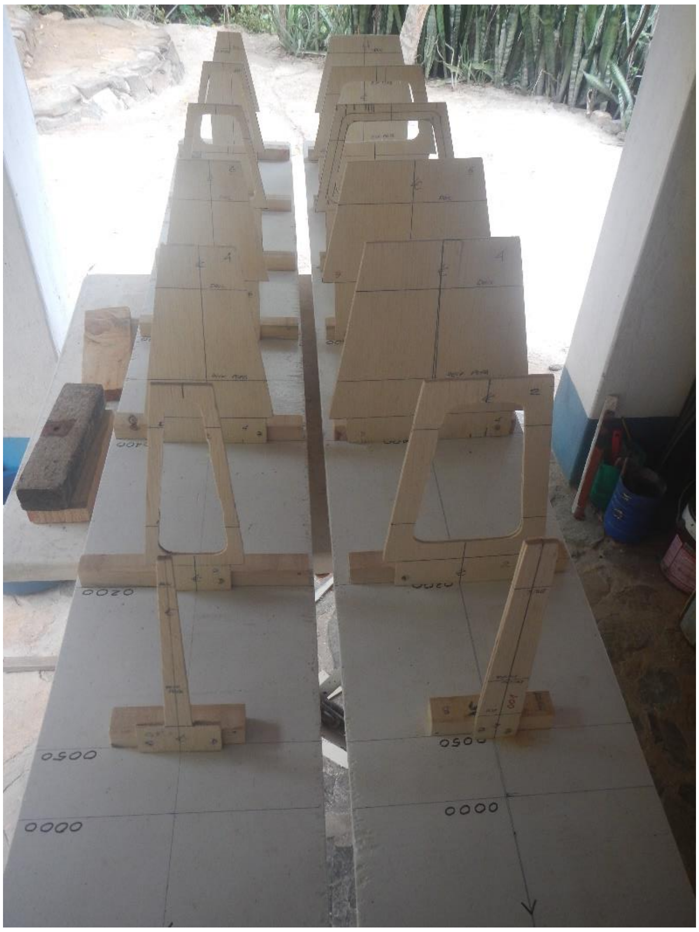


Figura 20 - Float and mainhull elements on their stongbacks.

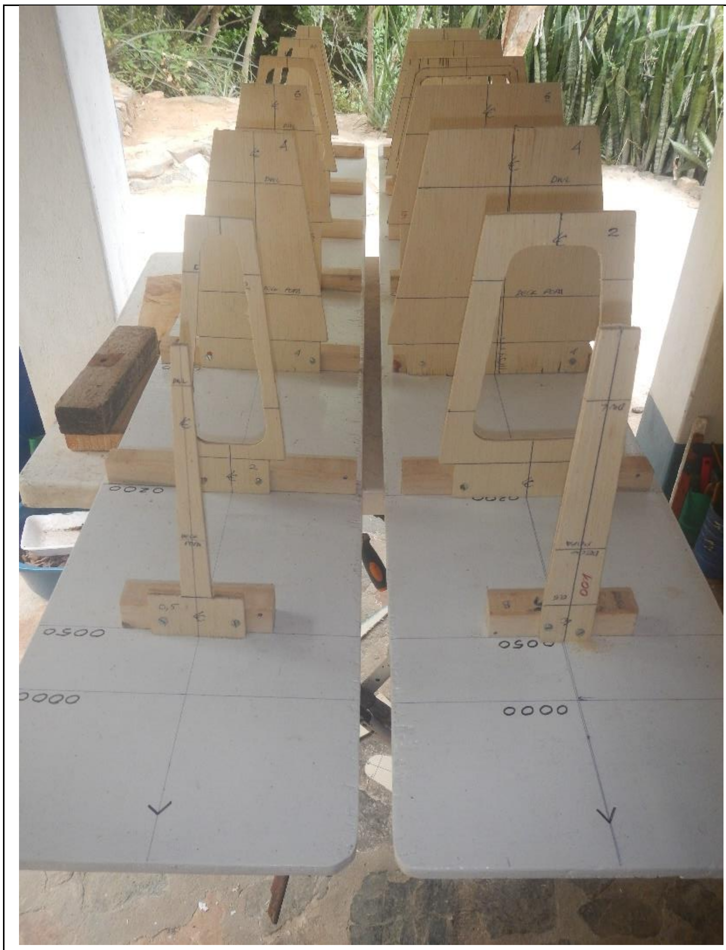


Figura 21 - Idem

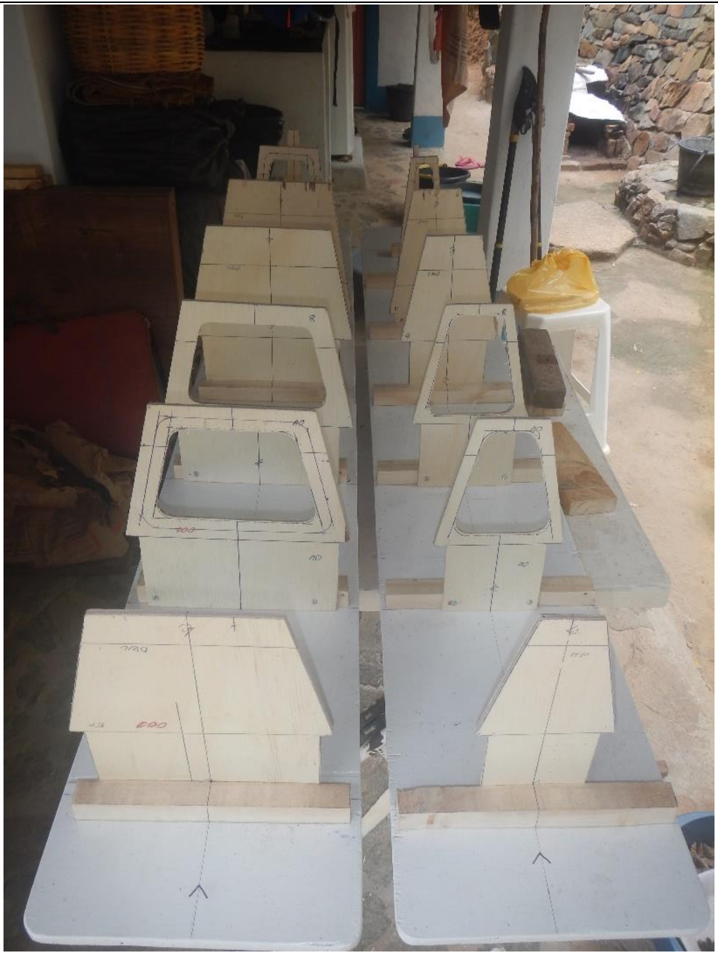


Figura 22 - Idem, from the tramson.

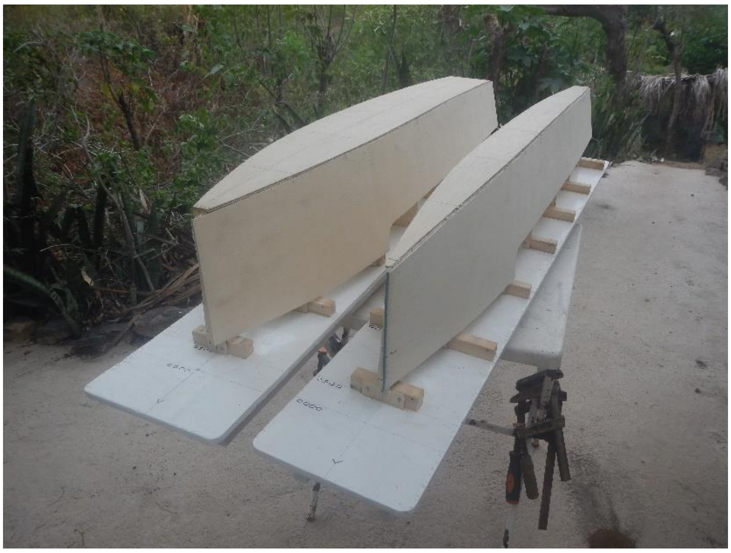
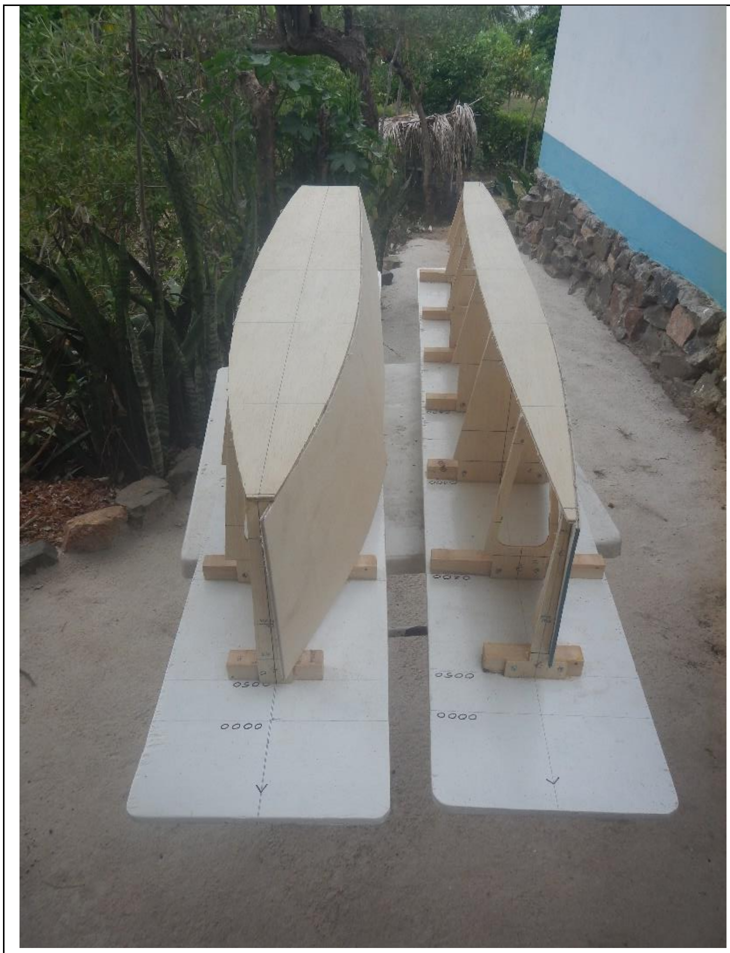


Figura 23 - Istalling hulls skins, 4mm plywood.



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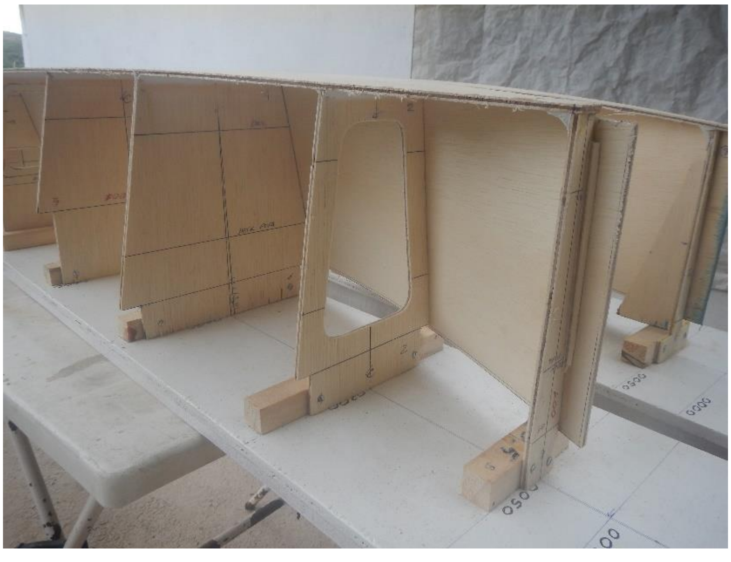

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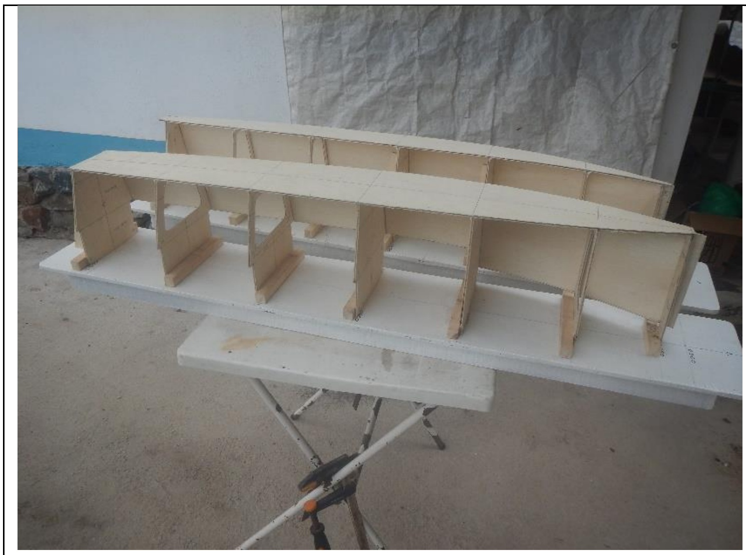

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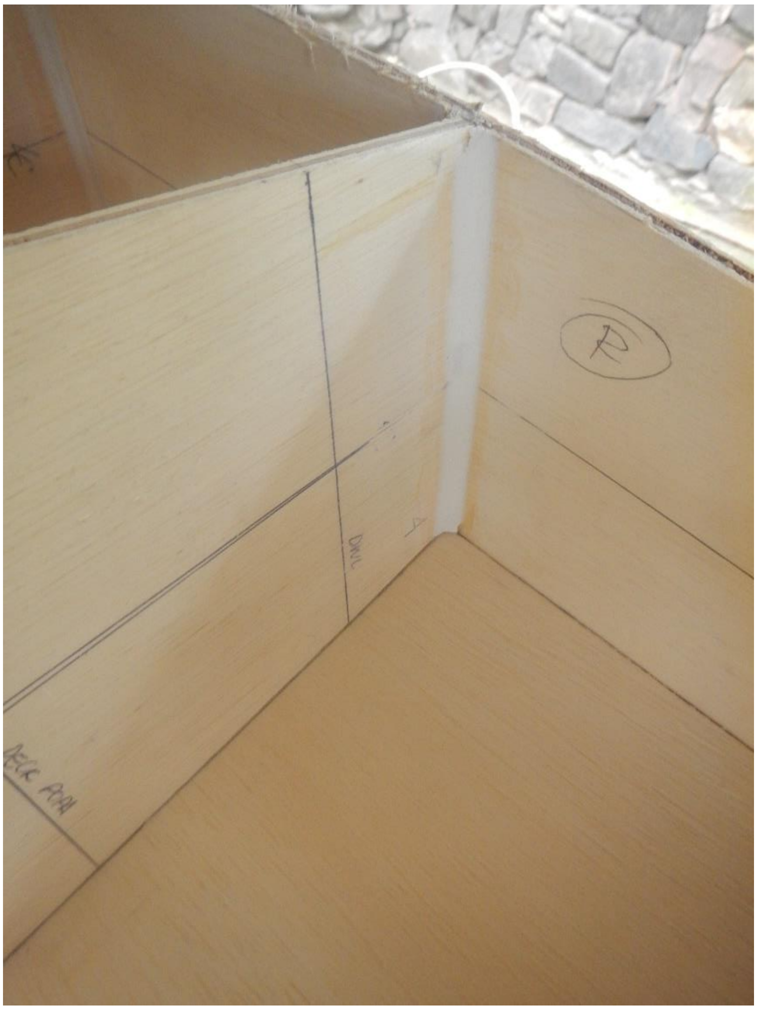


Figura 27 - Epoxy/microballoons fillet joins.

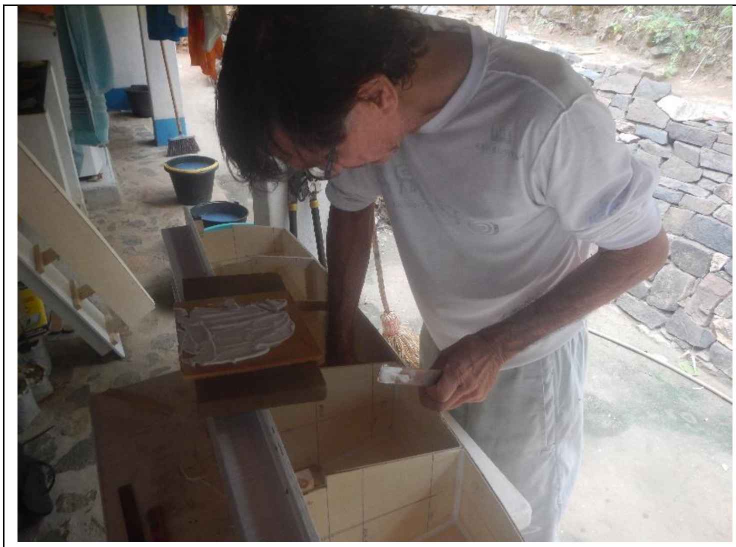
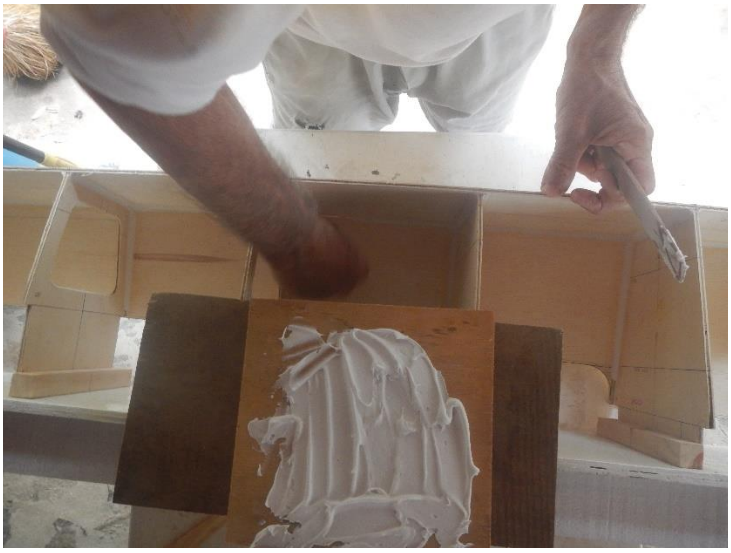


Figura 28 - Making the fillets.



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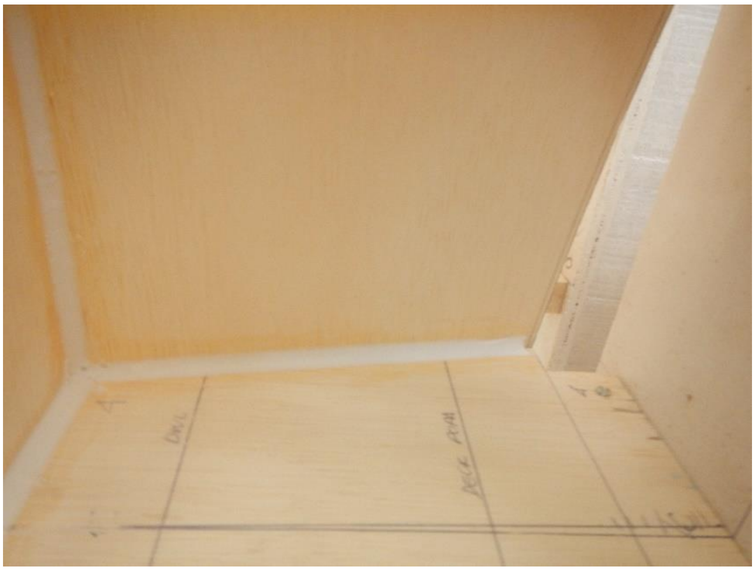

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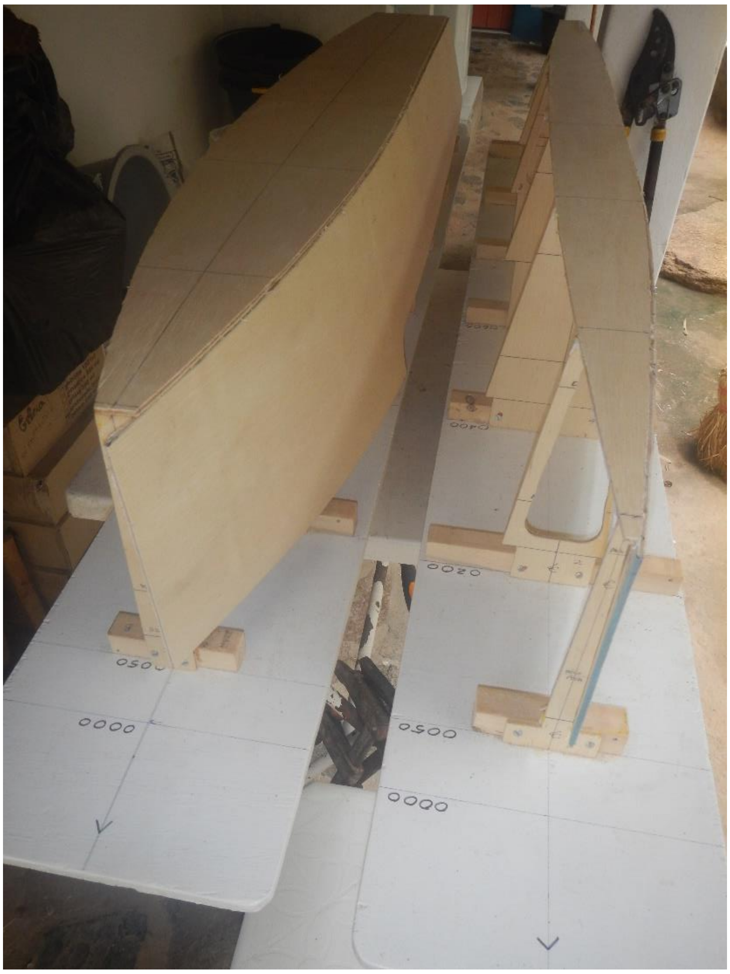
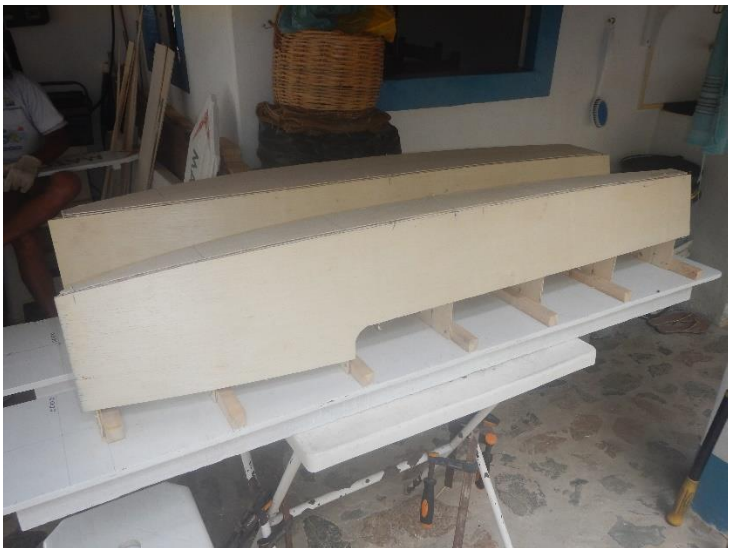


Figura 31 - Hull skins.



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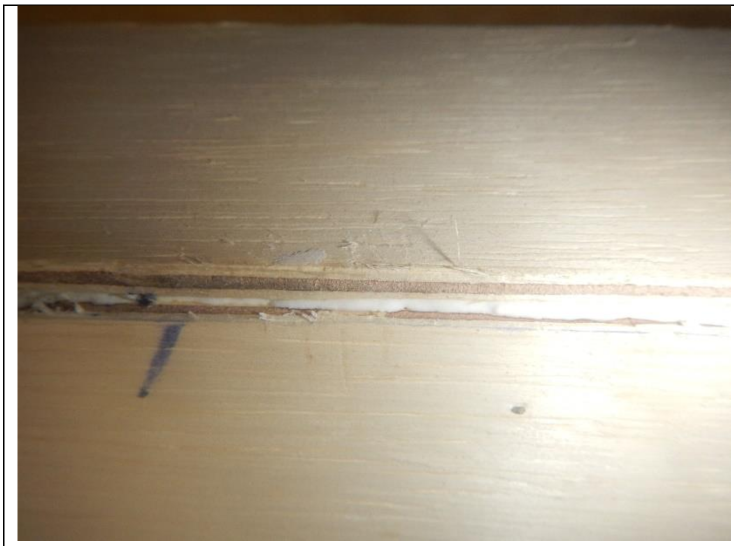


Figura 33 - Starting shaping of topsides/hull botton chine.

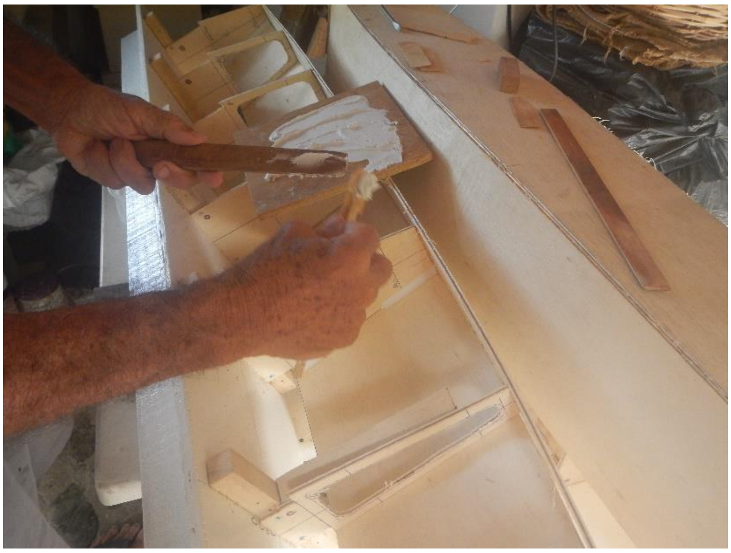
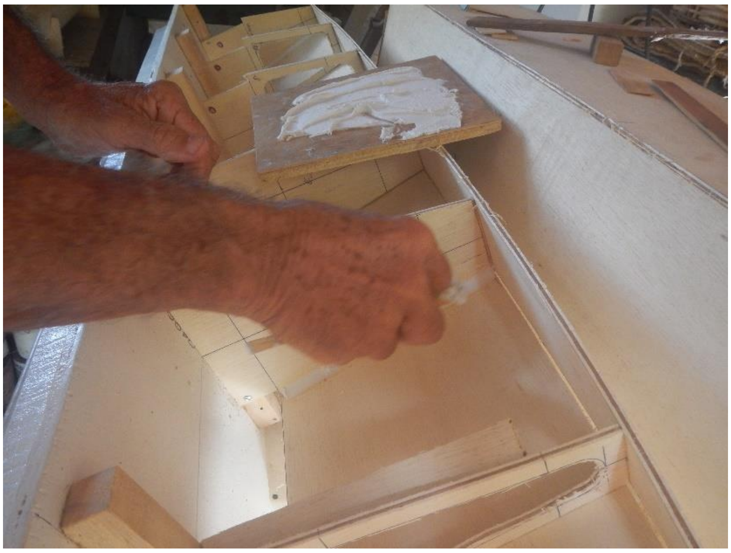


Figura 34 - Making fillets.



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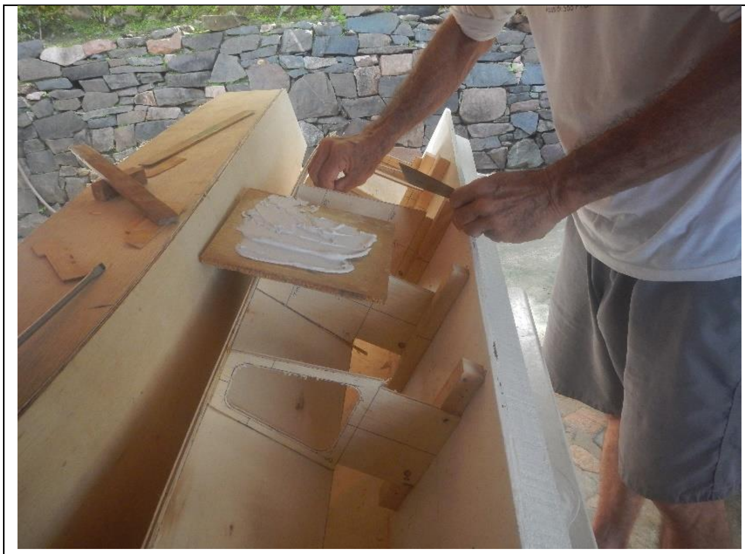

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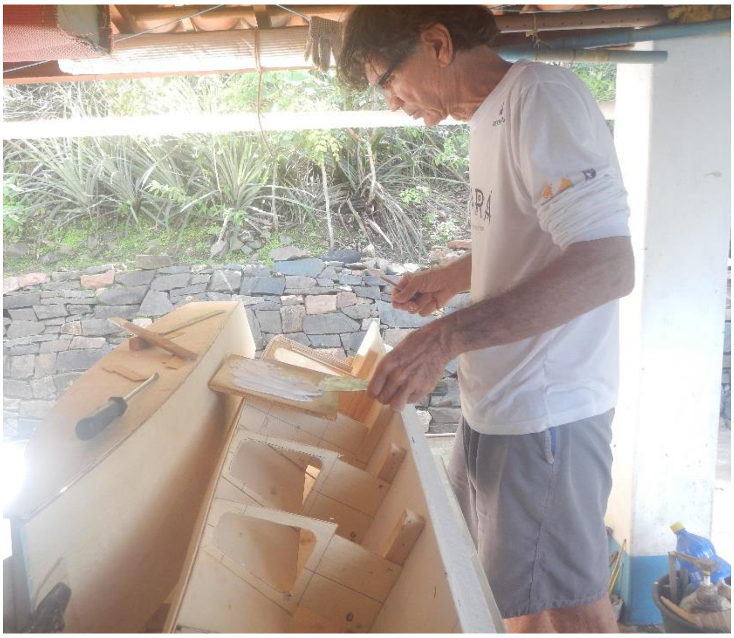


Figura 37 - Idem.

Figura 38 - Idem.

Figura 39 - Idem.

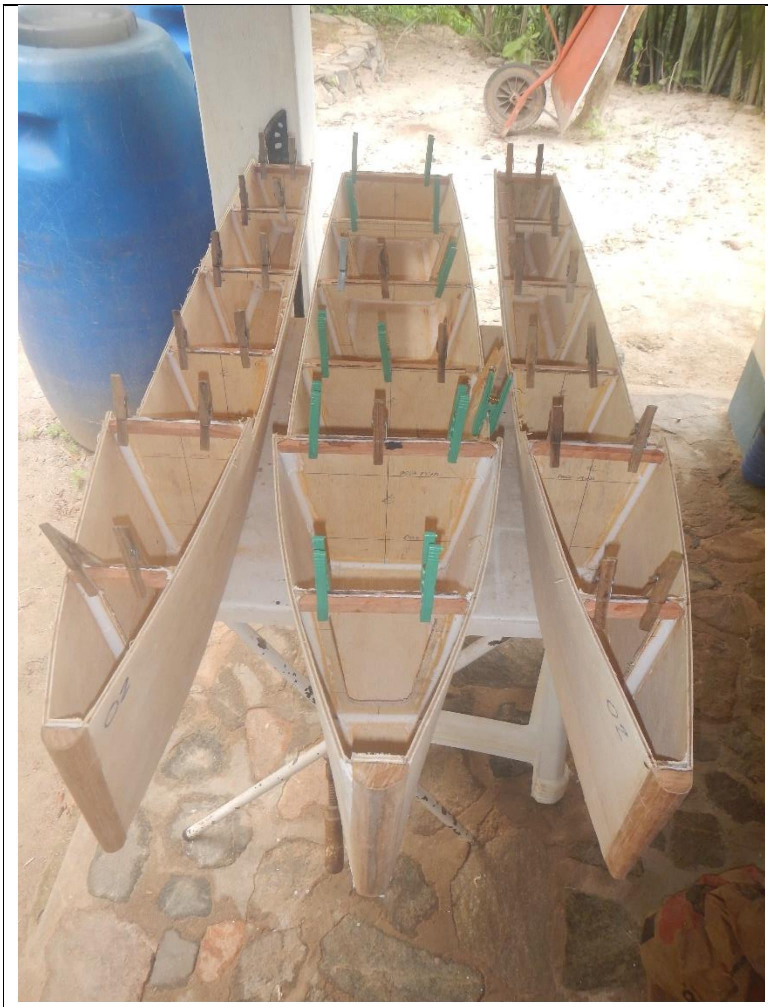
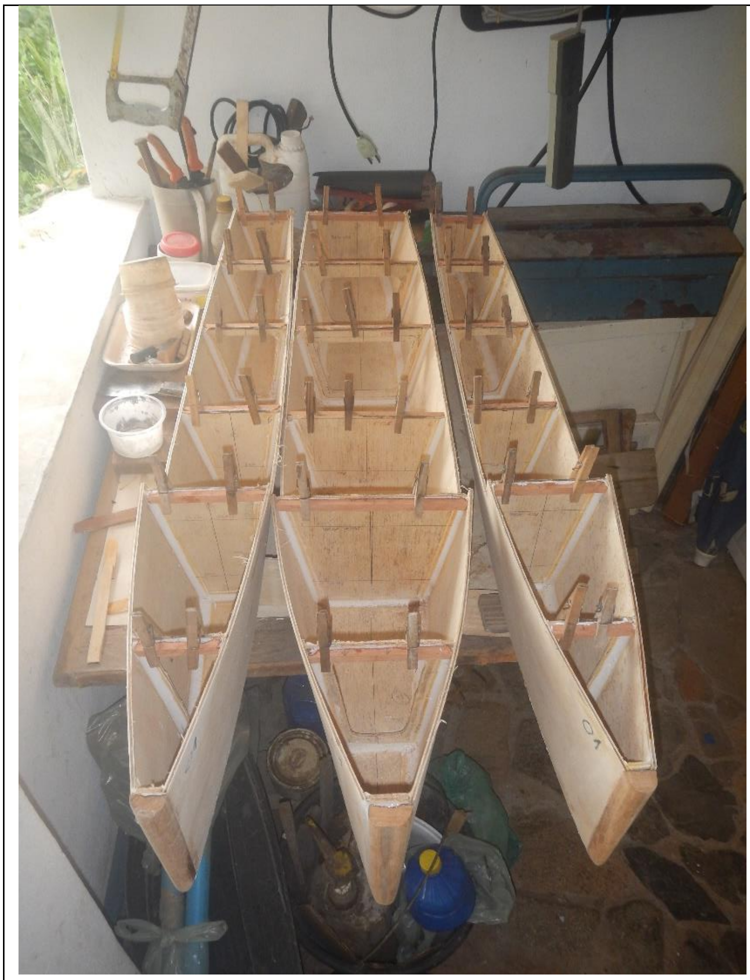


Figura 40 – Installing (bonding) bulkeads and frames beams.



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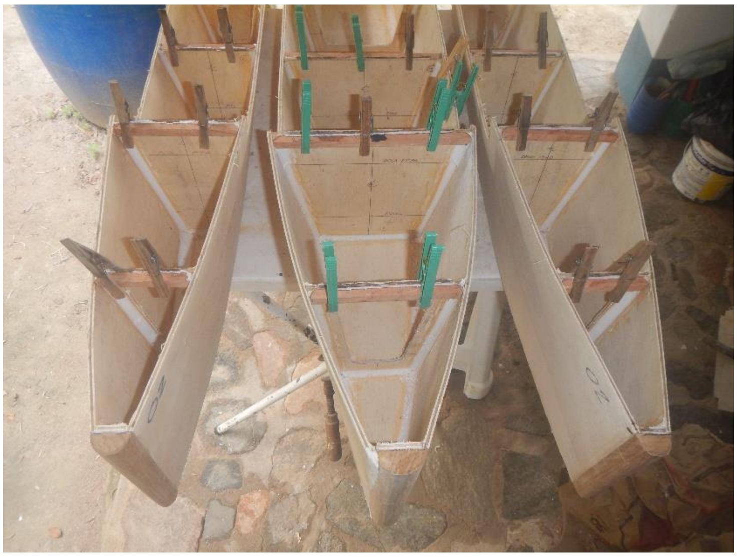

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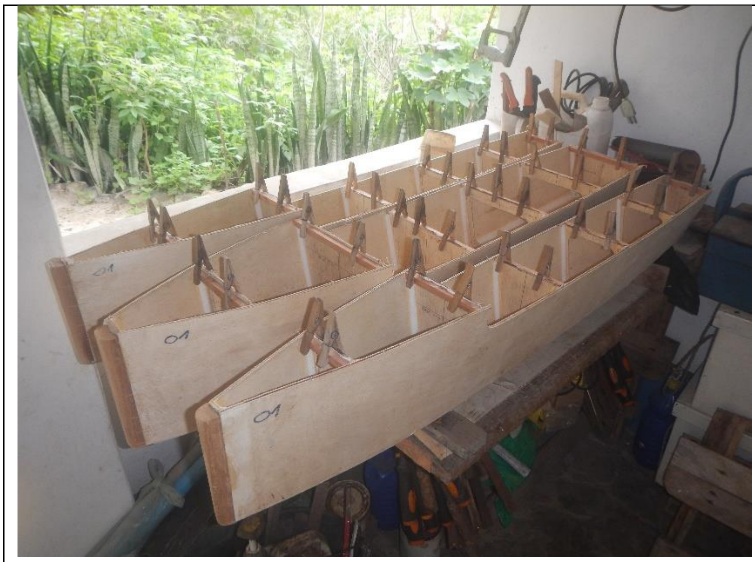

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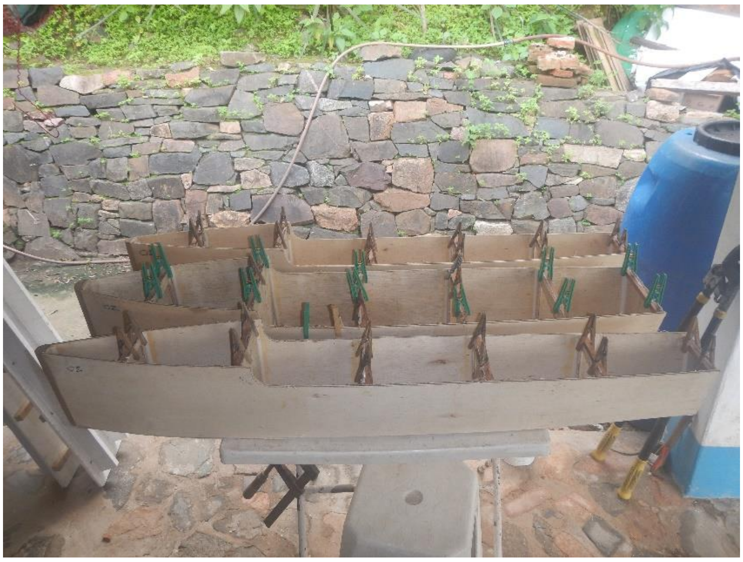

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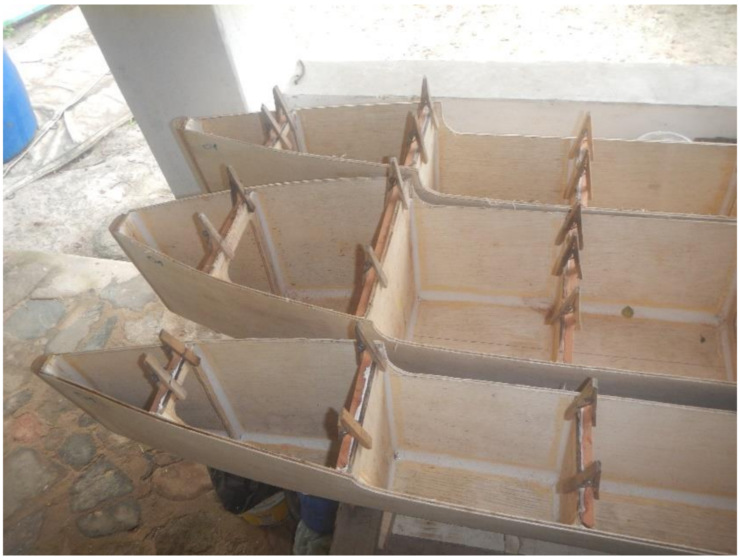

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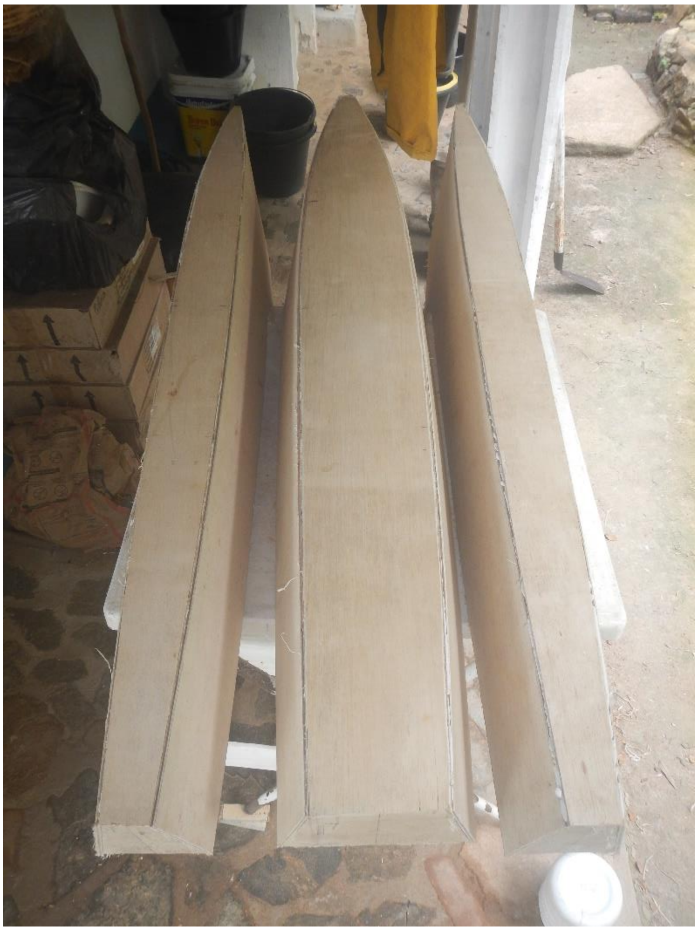


Figura 46 - Ready to shape the chines.

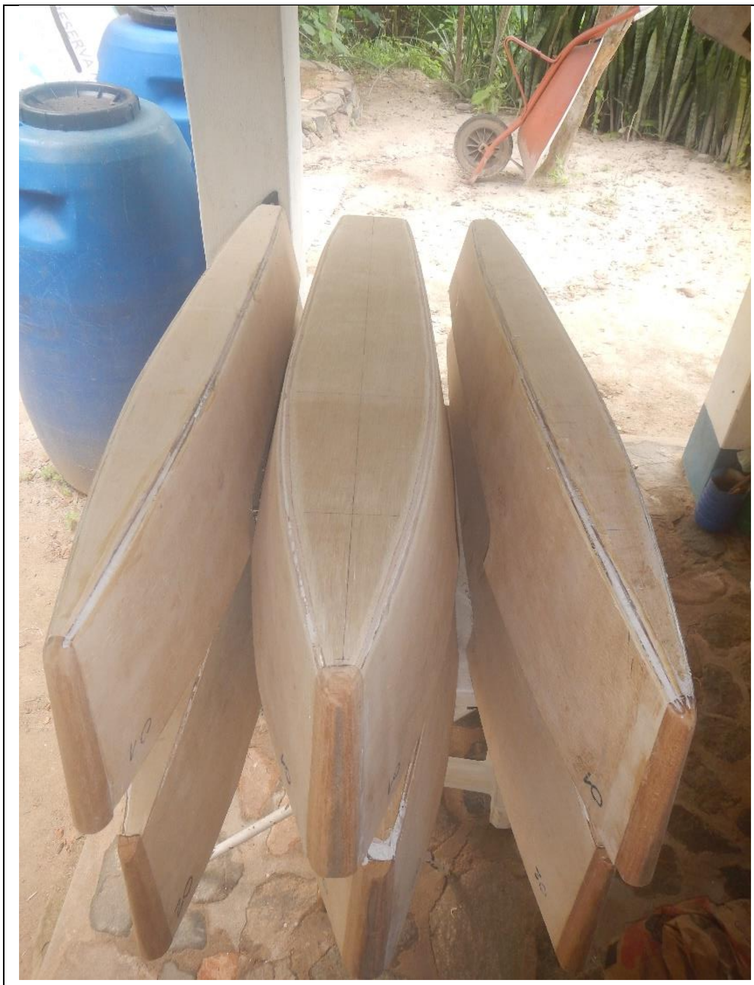
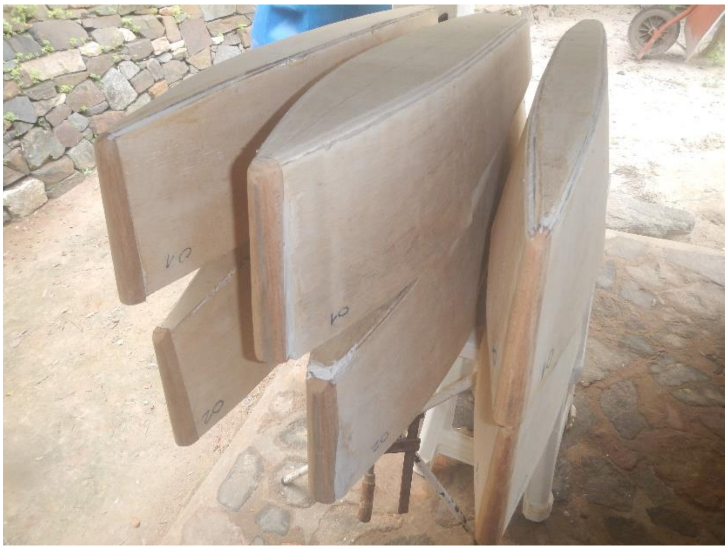


Figura 47 - Tri 01 with pre shaped chines.



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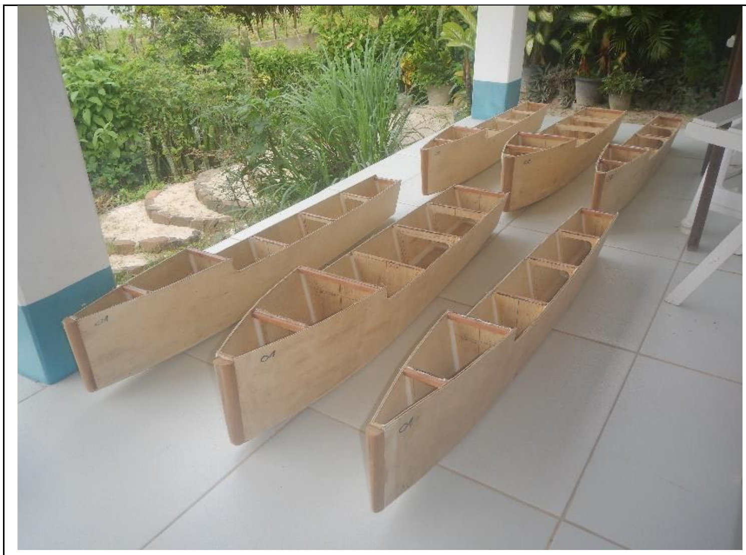
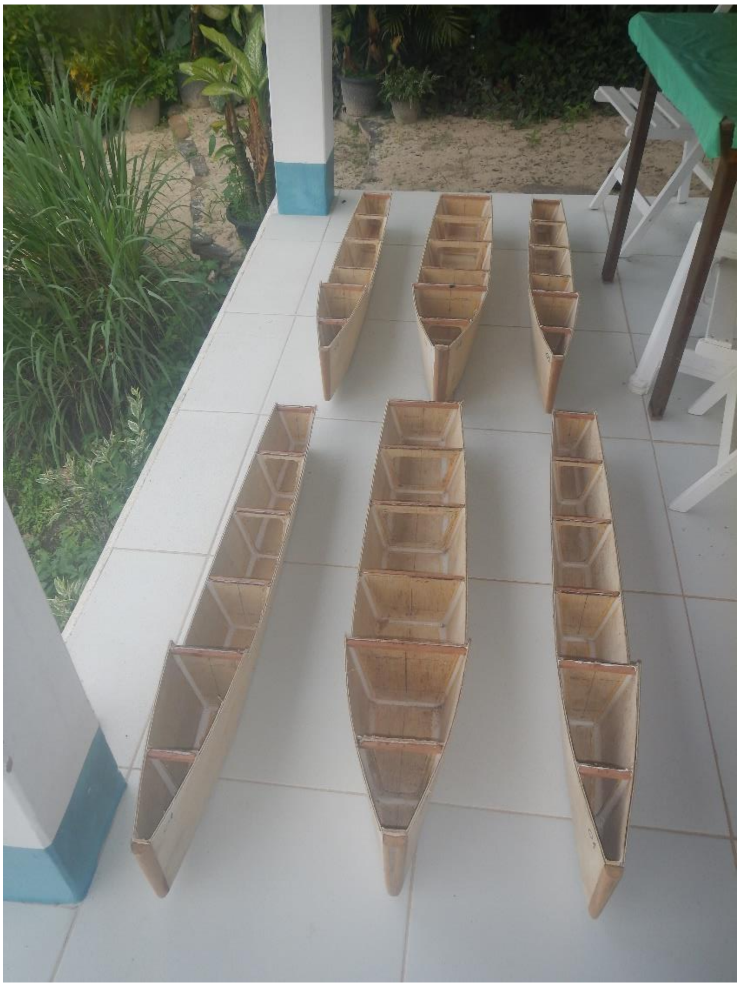


Figura 49 – A native trimaran armada.



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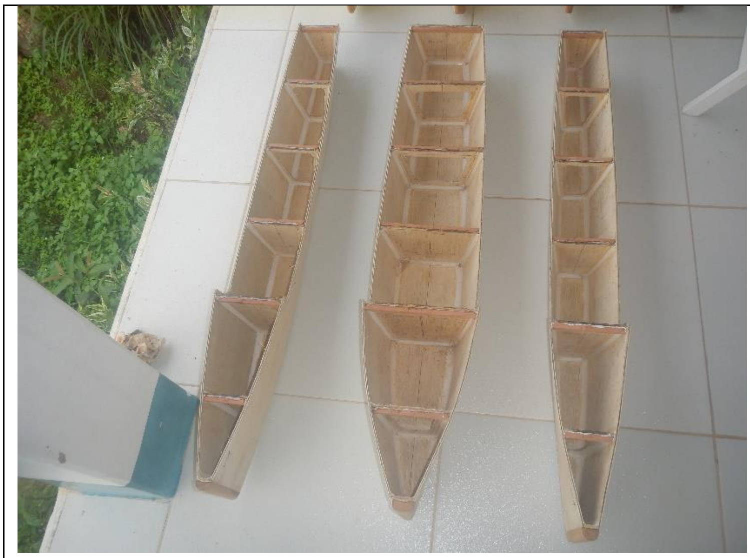

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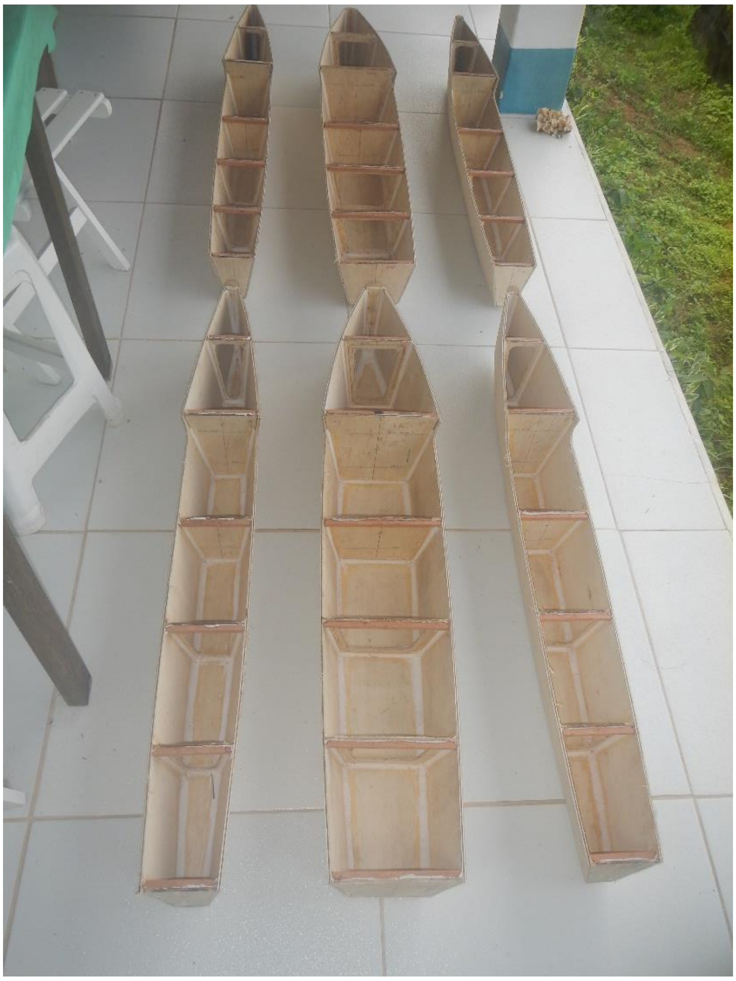

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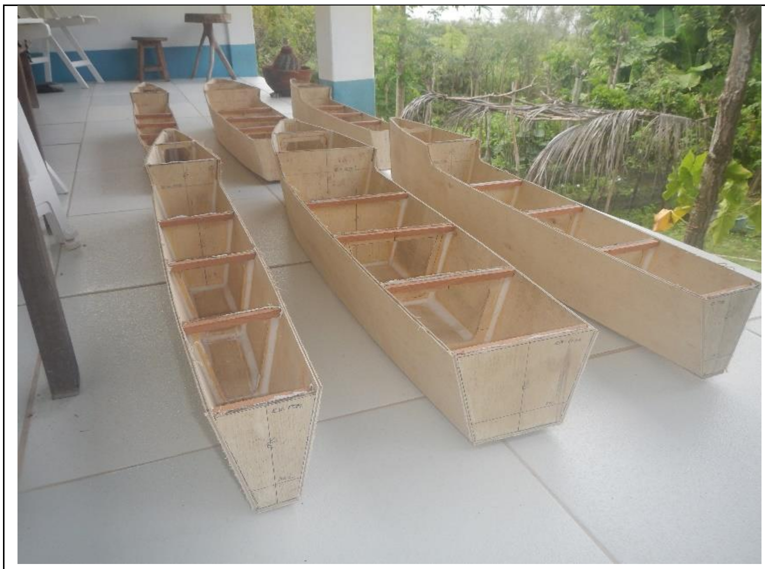

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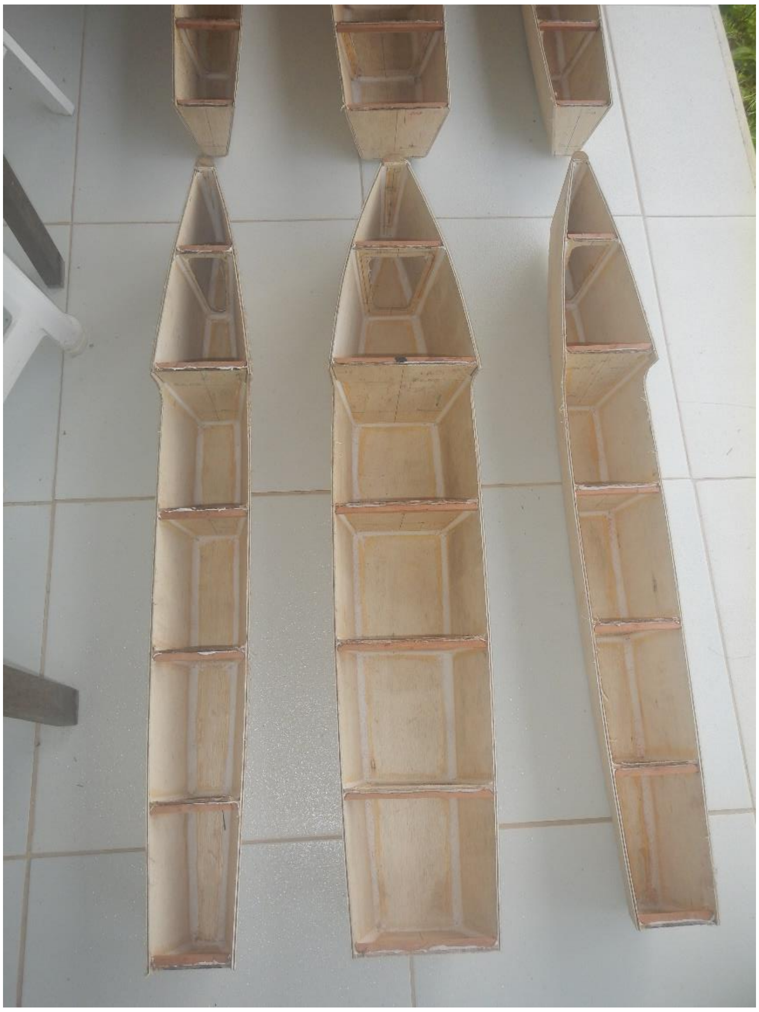

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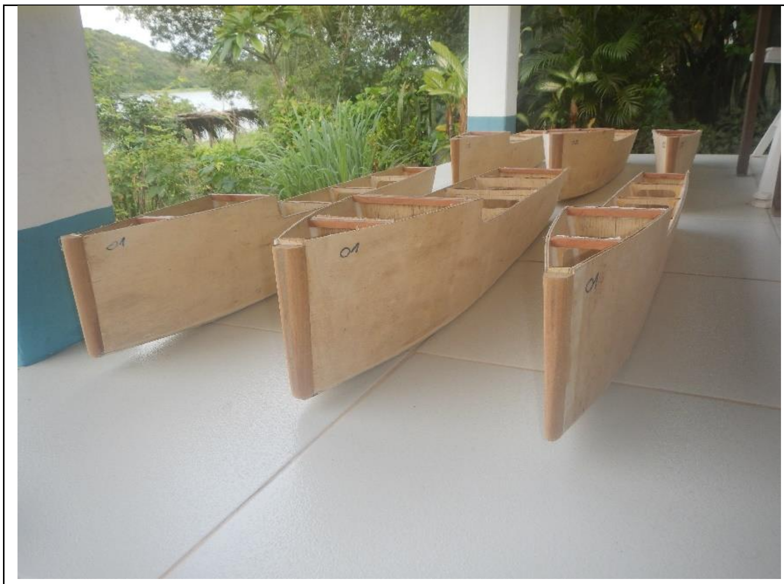

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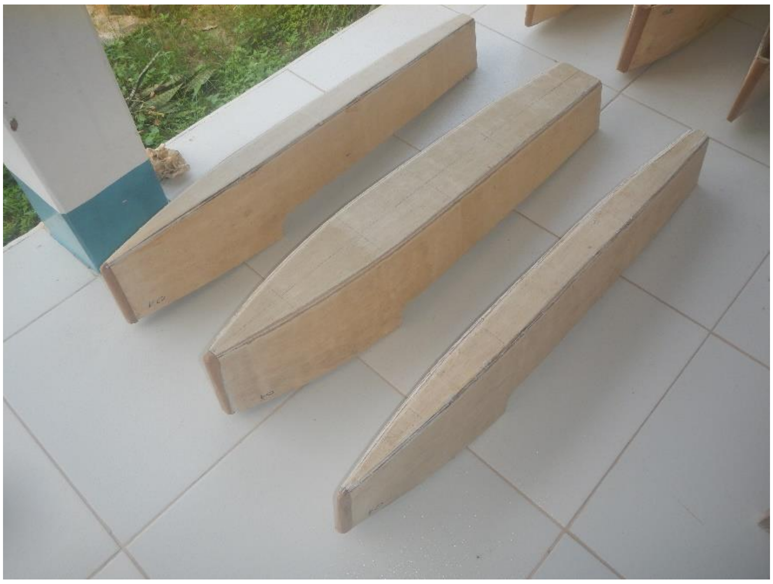

Figura 56 - Idem.

3. Next steps

In a few weeks, with the decks installed, the hull shells glassed, we will start to develop/decide the systems installation in the many usable volumes.

Reserva Mato da Onça, 17th july 2023

Carlos Eduardo Ribeiro Junior